



NOAA Technical Memorandum NMFS - SEFC - 246

Cmas Tutorial Workbook

LIVING MARINE RESOURCES
Computer Mapping & Analysis System

Gulf of Mexico Shrimp Harvest



Strategic Assessment Branch
Office of Oceanography and Marine Assessment
National Ocean Service
and
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National Marine Fisheries Service
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SOUTHEAST FISHERIES CENTER
NATIONAL MARINE FISHERIES SERVICE
NATIONAL OCEANIC AND ATMOSPHERIC
ADMINISTRATION
DEPARTMENT OF COMMERCE



**NOAA TECHNICAL MEMORANDUM
NMFS-SEFC-246**

Cmas Tutorial Workbook

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Cmas Tutorial Workbook

Version 1

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ABOUT THE TUTORIAL

This tutorial has been developed to enable users to familiarize themselves with the operations of the Computer Mapping and Analysis System (Cmas) Gulf of Mexico Shrimp Harvest Data Base. This is a cooperative effort between the National Marine Fisheries Service, Southeast Fisheries Center, Galveston Laboratory, and the Strategic Assessment Branch of the National Ocean Service. Each lesson steps the user through all important computer prompts. Some prompts will be discussed only one time, and then not included thereafter to save time and space (e.g., the computer often prompts, "Is this correct?"). The lessons are designed to take the user through sequentially more complex, and hopefully more interesting, system operations.

INTRODUCTION

The Cmas Gulf of Mexico Shrimp Harvest System is complex but relatively easy to use. The following lessons have been developed to take you through some basic system operations and provide examples of how the system may be used. Before using the system, here are a few helpful hints on using a Macintosh computer. More hints may be found in the Macintosh owner's guide that comes with the computer.

Helpful Hints

1. Basic Mouse Operations

Pointing is using the arrow on the screen to indicate things.

Dragging is holding down the button on the mouse while moving it. Dragging is used to highlight things and to pull down menus.

Clicking is pushing down and releasing the button on the mouse to actuate an operation.

Double-Clicking is pushing down on the mouse button twice in rapid succession and is used to open a file.

2. Caps Lock Key

When loading the system, make sure the caps lock key is down.

3. Saving a Screen Image

While using the system, you may wish to save screen images for use in other applications. This is done by sending the image to the clipboard, and subsequently retrieving when out of the Cmas system. However, the clipboard can store only one screen image at a time. One way to save many images is to use the SCRAPBOOK desk accessory.

When the Cmas system is loaded use the mouse to select "SCREEN TO CLIPBOARD" from the "IN/OUT" menu. The top line of the screen will momentarily go white and then reset.

Select "SCRAPBOOK" from the "APPLE" menu (apple icon on top at far left). The scrapbook will appear on the screen, and two new menus, "FILE" and "EDIT" will appear at the top. Select "PASTE" from the "EDIT" menu. You should see only a portion of the image appear in the Scrapbook (however, the entire image has been saved). Select "CLOSE" from the "FILE" menu. The Scrapbook will disappear. To restore the original image on the screen, select "CLIPBOARD TO SCREEN" from the "IN/OUT" menu.

4. Color Screen

If you have a Macintosh II with a color screen, make sure that no more than 16 colors are selected in the control panel.

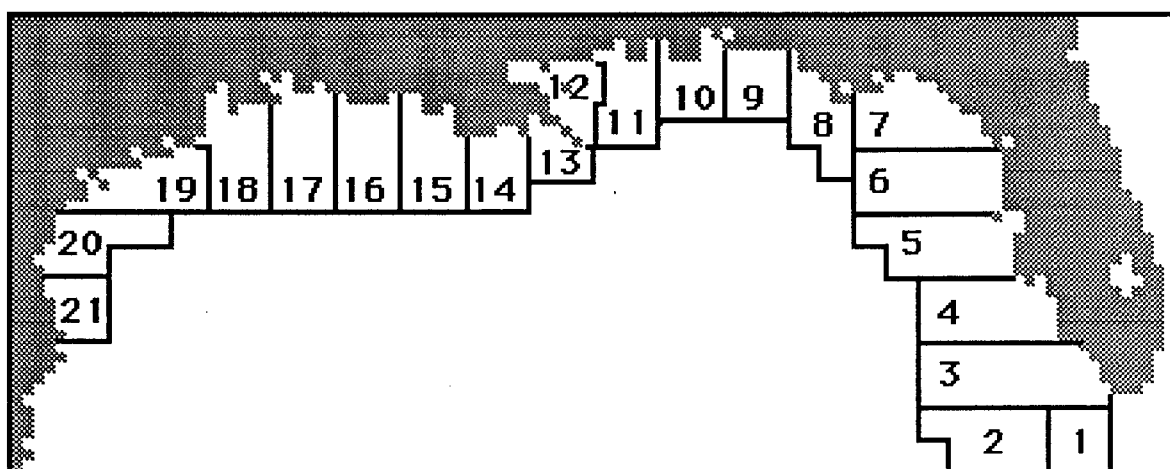
About the Data Base

Accurate statistics of U.S. shrimp trawling operations and production in the Gulf of Mexico have been collected by NMFS since 1956. To facilitate geographical assignment of commercial trawling effort and shrimp catch, the U.S. continental shelf of the Gulf of Mexico has been subdivided coastwide into 21 statistical subareas. These areas have each been further subdivided into an inshore area and into five fathom increments of depth in the offshore area. Fishery statistics information is reported by these areal divisions ("location cells") and are used in this program to gain access to data from a given location. Data is stored within these cells for each month from January 1960 to December 1988. Data types includes shrimp species, fishing effort, shrimp size, shrimp value and mathematical combinations of these data.

Loading the Program

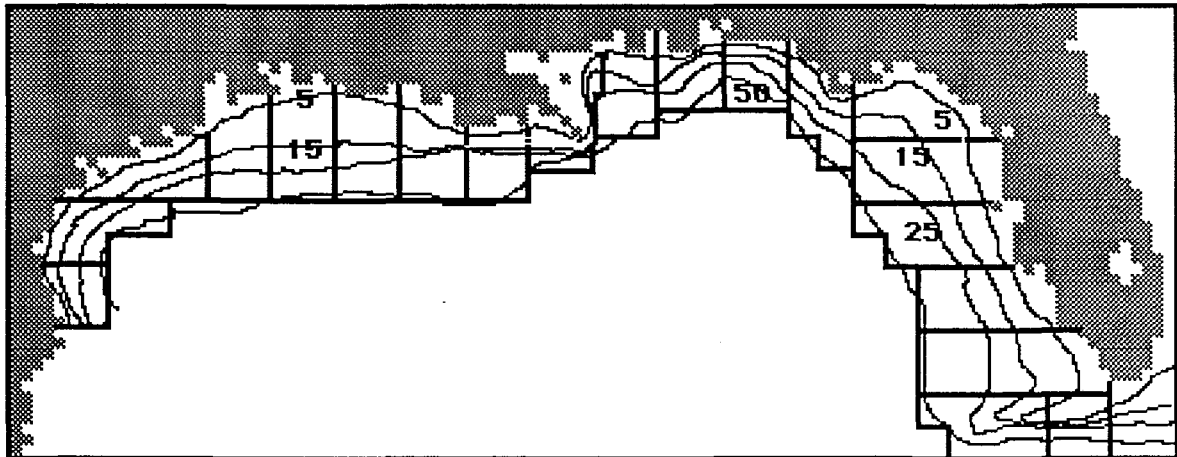
The Cmas program runs under a programming system known as APL. When you start the program by DOUBLE-CLICKING on the *Cmas-SHRIMP HARVEST* icon you will see an information screen from which you select the data base within which you would like to operate. For all tutorial items we will only use the Brown, White and Pink selection. CLICK on this box with the mouse and the Cmas program logo appears. The Cmas logo screen is on the cover page of this tutorial. Enter RETURN and the screen below appears. This screen and the one after it are informational. Enter RETURN key until you see the Main Menu.

THE DATA BASE



Statistical Areas for Reporting Shrimp Catch

THE DATA BASE



Statistical Areas/Depth Zone (fathoms)

- | | | | | | |
|---------|----------|----------|----------|-----------|---------|
| 1. <5 | 3. 10-15 | 5. 20-25 | 7. 30-35 | 9. 40-45 | 11. >50 |
| 2. 5-10 | 4. 15-20 | 6. 25-30 | 8. 35-40 | 10. 45-50 | |

The Main Menu of the Cmas program lets the user select from 5 different operations (operation 6 ends the Cmas session). Each lesson of this tutorial will take you through one of these operations and familiarize you with some of the capabilities of that operation. Shown below is the Main Menu.

THE MAIN MENU

The following operations are available:

- 1. Part 1: Defining Analysis Areas*
- 2. Part 2: Making Maps and Simple Summations*
- 3. Part 3: Time Series Histograms*
- 4. Part 4: Tabular Summaries*
- 5. Part 5: Working with Stored Maps*
- 6. END SESSION*

(There is no default)

Enter Single Number

Lesson 1. Making Maps and Simple Summations.

This exercise illustrates the basic structure of the data base and will familiarize you with the output displays. For reasons which will become apparent in Lesson 2, we will skip PART 1 of the Main Menu and begin with "Part 2. Making Maps and Simple Summations."

In this exercise a series of outputs will be developed for the combined landed weight of brown shrimp during the months of May, June, July, and August from 1984-1986.

Enter 2, from the Main Menu and RETURN. The program will prompt you with "You have Entered: 2 Is this correct?(Y/N)". Enter 'Y' key and the RETURN. (NOTE: 'Y' is the default and RETURN could simply be pressed if you want a yes response.) Throughout the Cmas program you are given the opportunity to correct entries in this fashion. This prompt will not be mentioned further.

The following appears:

PART 2. INDIVIDUAL MAPS AND SIMPLE SUMMATIONS

This part allows the user to view a single data element or a sum of data elements. A data element is a single month of data for one species; for example, total weight landed, brown shrimp, May 1985.

You will be prompted for:

- 1. Species**
- 2. Data type (e.g., total weight)**
- 3. Size category**
- 4. Years**
- 5. Months**
- 6. Analysis areas**

This screen is informational, so enter RETURN.

The following appears:

SPECIES SELECTION

- 1. Brown Shrimp**
- 2. Pink Shrimp**
- 3. White Shrimp**

(There is no default)

Select any combination

This lesson will use brown shrimp only, so enter 1 followed by RETURN. (NOTE: Any combination of species may be entered). The following appears:

DATA TYPE SELECTION

The data base has three categories of data. Landed weight is subdivided into five conversion options. Ex-vessel value is subdivided into three conversion options.

- 1. Landed Weight**
- 2. Ex-Vessel Value**
- 3. Days Fished**

(There is no default)

Select one

This lesson will use landed weight only, so enter 1 and RETURN. (NOTE: only one data type may be entered). The following appears:

SIZE CATEGORY SELECT

1. All sizes, including pieces

Excluding Pieces:

- | | |
|-----------------------|--------------------------------------------|
| 2. <15 counts/pound | 9. >67 counts/pound |
| 3. 15-20 counts/pound | <i>For post-1983 data:</i> |
| 4. 21-25 counts/pound | 10. 67-80 counts/pound |
| 5. 26-30 counts/pound | 11. 81-100 counts/pound |
| 6. 31-40 counts/pound | 12. 101-116 counts/pound |
| 7. 41-50 counts/pound | 13. >116 counts/pound |
| 8. 51-67 counts/pound | (Note: 10-13 CANNOT BE CHOSEN
WITH "9") |

(The default is 1)

Select 1 or any combination of 2 through 13

This lesson will use all size categories, including pieces, so enter 1 and RETURN. The following appears:

WEIGHT CONVERSION SELECTION

Heads Off Weight

1. pounds
2. kilograms

Heads On Weight

3. pounds
4. kilograms

Number of Animals Only

5. no units

(The default is 1)

Select one

This lesson will use heads off weight, in pound units, so enter 1 and RETURN. The following appears:

YEAR SELECTION

0. 1960	10. 1970	20. 1980	29. 1960-1969
1. 1961	11. 1971	21. 1981	30. 1970-1979
2. 1962	12. 1972	22. 1982	31. 1980-1985
3. 1963	13. 1973	23. 1983	
4. 1964	14. 1974	24. 1984	
5. 1965	15. 1975	25. 1985	
6. 1966	16. 1976	26. 1986	
7. 1967	17. 1977	27. 1987	
8. 1968	18. 1978	28. 1988	
9. 1969	19. 1979		

(There is no default)

Select any combination

This lesson will use the years 1984-1986, so enter '24 25 26' (be sure each is separated by a space) and RETURN. The following appears:

MONTH SELECTION

1. January	7. July
2. February	8. August
3. March	9. September
4. April	10. October
5. May	11. November
6. June	12. December

13. January through December (all months)

(The default is 13)

Select 13 or any combination of 1 through 12

This lesson will use the months of May, June, July, and August, so enter '5 6 7 8', in this order, (be sure they are separated by a space) and RETURN. The following appears:

OUTPUT SELECTION

1. Map Table (Depth zones by subareas)
2. Schematic Map of Region
3. Summary Statistics
4. Histogram Summary by Statistical Subareas
5. Histogram Summary by Depth Zone

6. Save Map in User's Files

(The default is 1, 2, 3, 4, and 5)

Select any combination

Presently there are six choices of outputs in the system. Any combination may be selected in any order, and outputs may be repeated. The most important point to remember for this selection is that you will be able to change "mapping intervals" only for the first output selected. After these intervals have been selected they will remain for all subsequent outputs. To become familiar with the outputs we will select all of them. Enter RETURN (the default for selecting all outputs). The following appears:

SELECTING TWO AREAS

Do you want to select your areas for the run?

If you answer "N", the computer will select:

AREA 1. Gulf of Mexico Study Area (SA 1-21, DZ 0-10)

AREA 2. Gulf of Mexico, Offshore (SA 1-21, DZ 1-10)

Enter "Y" or "N"

The "slicing" of the data base by area is an important feature which is covered in detail in the next lesson. For now enter 'N' and RETURN to accept the default values: 1) Entire Study Area (all Statistical Areas and Depth Zones), and 2) all Statistical Areas (Depth Zones 1-10). The following appears:

LABELING OUTPUTS

The label specified is the only means of identifying outputs. A clear label is needed to export an output to another application. Labels may have a maximum of 60 characters.

Example 1:

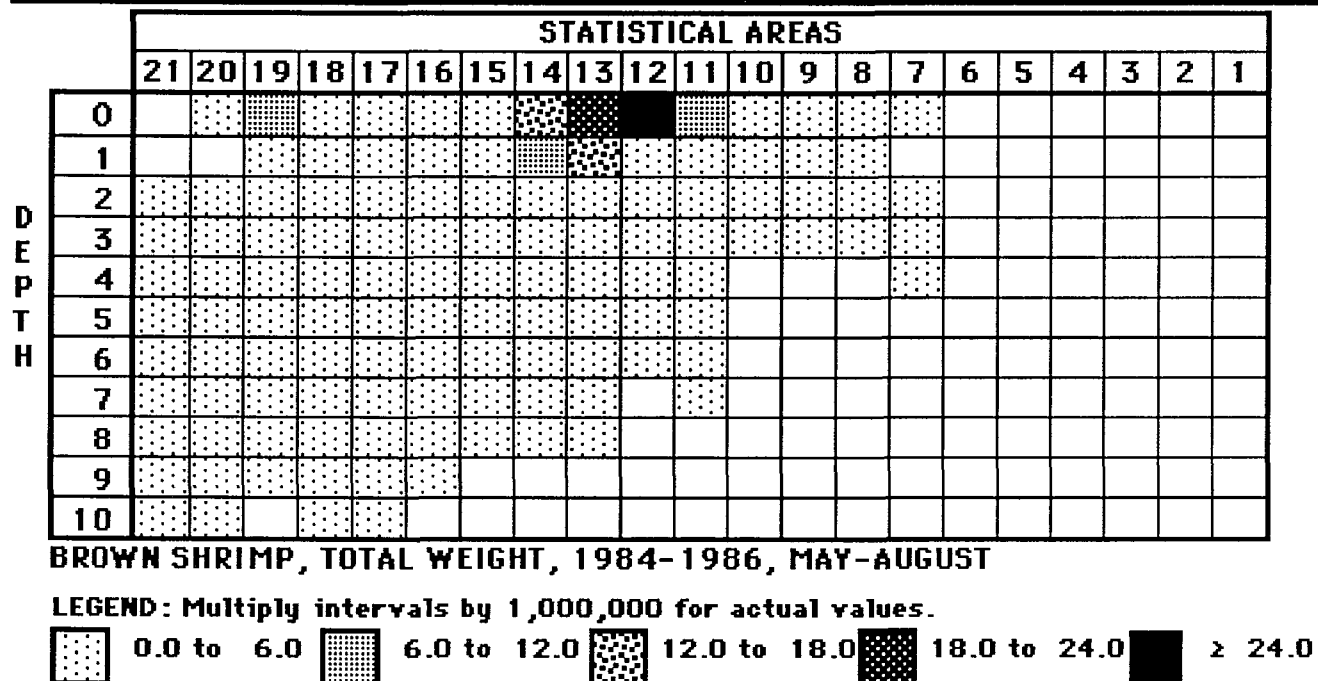
**Brown/Pink, Total Weight (<40), 1975-1979, May-September
(51 characters)**

Example 2:

**White, Total Value, Fathoms 1-3, 1987, Jan-Dec
(46 characters)**

Enter name for this run

A clear description of the run is essential to maintain an accounting of the outputs. Enter 'Brown Shrimp, Total Weight, 1984-1986, May-August' for your description followed by RETURN. The computer will now indicate the processing sequence. When completed a screen will appear to let you know that the first series of output screens will be for the base area selected. Enter RETURN and the first output you requested will appear:



Examine this table carefully. Note that the columns (Statistical Areas) are in descending order (21, 20, ..., 1). This is done deliberately to reflect the east to west orientation of the areas in the Gulf of Mexico. The rows represent the depth intervals; 0 = inshore, 1 = <5 fathoms, 2 = 6-10 fathoms, and so on. Another important point to note is the phrase "Multiply intervals by 1,000,000 for actual values". Thus the first interval (0.0 to 6.0) spans the range 0.0 to 6,000,000 pounds (total weight); the rightmost interval (>24) includes subareas exceeding 24,000,000 pounds. After studying the table enter RETURN. The computer will now enquire whether you wish to change intervals. Enter 'Y' for changing intervals and RETURN. The "Interval Selection" screen will appear:

ACTUAL VALUES

Maximum: 30,120,482

Minimum: 0

**NOTE: For simple display and ease of keyboard entry,
actual values have been adjusted by a multiple of 10.**

MAPPED VALUES

Factor of 10 Multiplier: 1,000,000

Maximum Mapped Value: 30.1

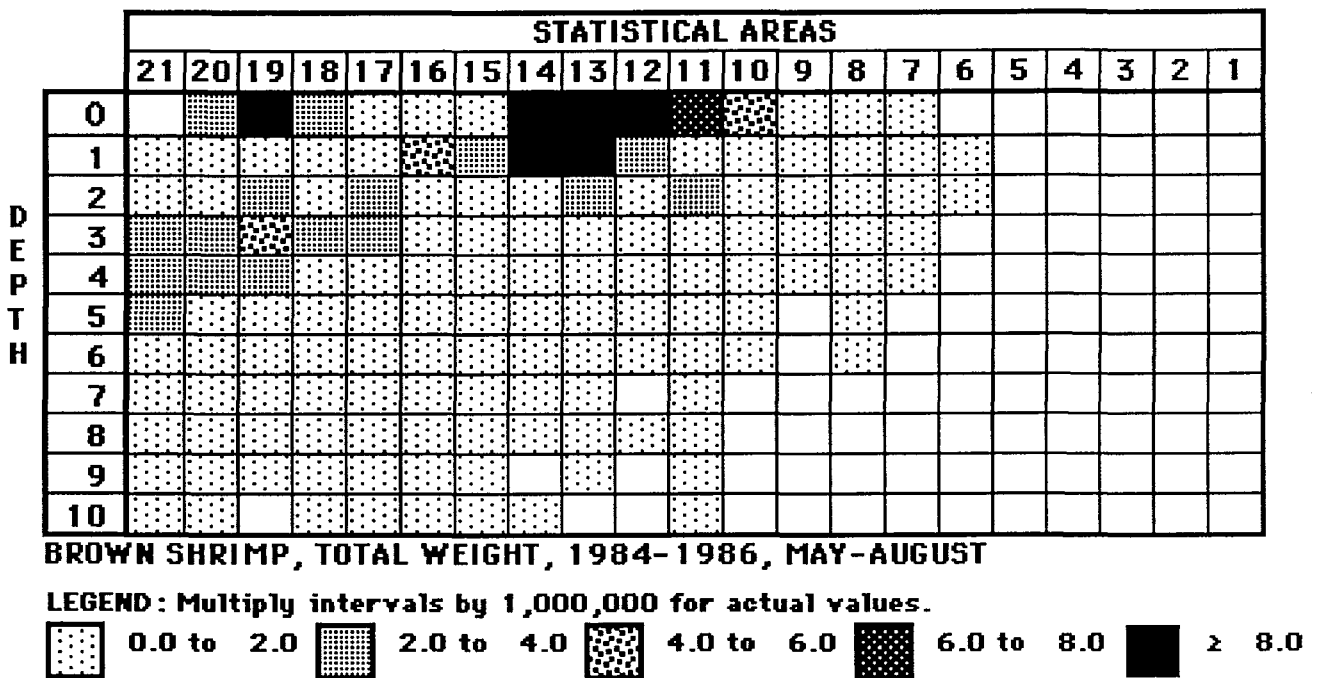
Minimum Mapped Value: 0.0

Present Interval Minimums: 0.0 6.0 12.0 18.0 24.0

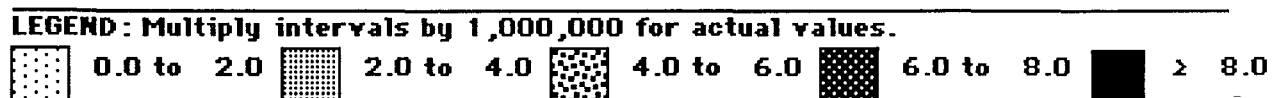
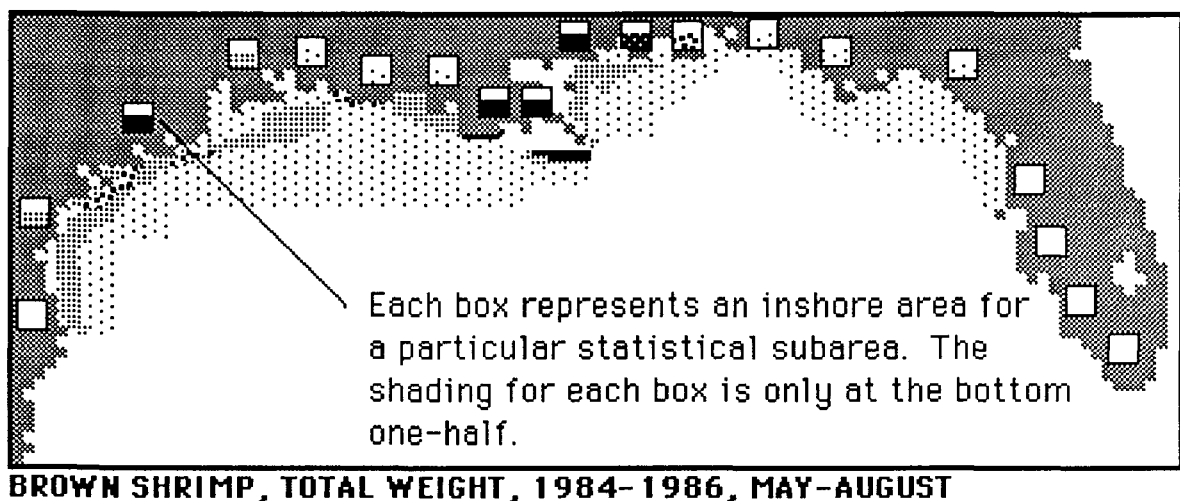
**ENTER UP TO FIVE NUMBERS REPRESENTING THE LOWER LIMITS
FOR EACH OF THE NEW INTERVALS. THE MAXIMUM MAPPED VALUE
WILL BE SET AS THE OVERALL UPPER LIMIT.**

This screen provides the information needed to reset the intervals. We will set our intervals lower. It is important to note that when resetting intervals you should start with a number just above zero, e.g., 0.001. This will permit all positive values to be shaded but will not shade subareas with no data. "Zero subareas" will remain blank. Also note that entries are the type of number (1-2 digits) associated with the intervals. The computer will correct for the "Factor of 10 Multiplier". Enter '0.001 2 4 6 8' followed by RETURN.

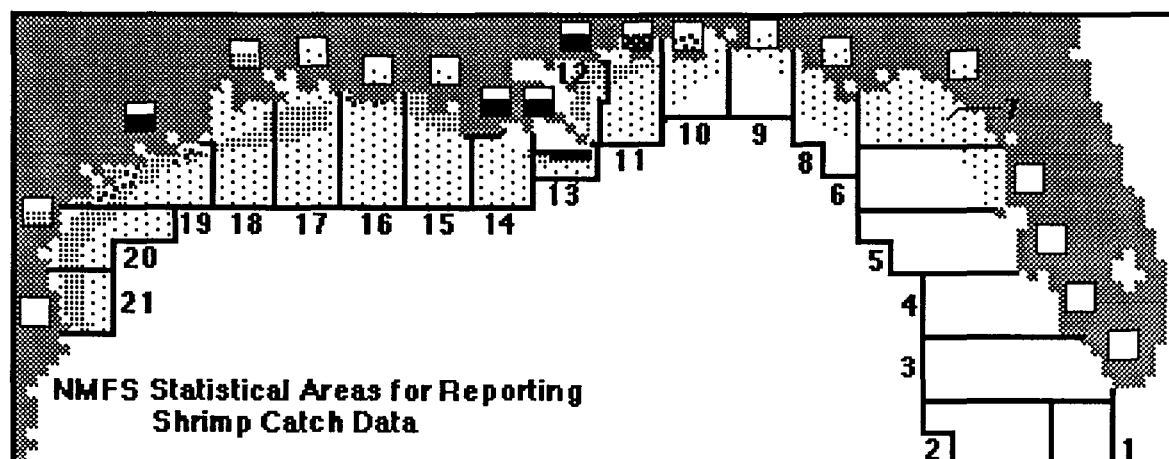
The following appears:



DO NOT HIT RETURN. We are going to save this table as a reference for Lesson 2. With the mouse select "STORE TABLE FOR DRAWING" from the "IN/OUT" menu. This will save a copy of the table in the computer's memory (Not the clipboard). After the selection, enter RETURN to continue. Enter 'N' to the prompt for changing intervals (you could repeat the change interval process as many times as you wish) and RETURN. The next output, a schematic map appears:

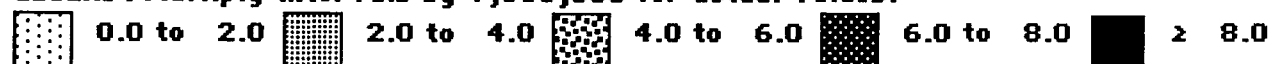


DO NOT HIT RETURN. At the uppermost part of the screen you will see a menu item labeled "MAP REFS" for "map references". This menu allows you to place any of several "transparent" overlays on the map image as spatial references. With the mouse select "STATISTICAL AREAS" from the "MAP REFS" menu. The top line will go blank for a moment, then the areas will be superimposed on the screen.



BROWN SHRIMP, TOTAL WEIGHT, 1984-1986, MAY-AUGUST






LEGEND: Multiply intervals by 1,000,000 for actual values.



Enter RETURN. The following appears:

SUMMARY STATISTICS

BROWN SHRIMP, TOTAL WEIGHT, 1984-1986, MAY-AUGUST

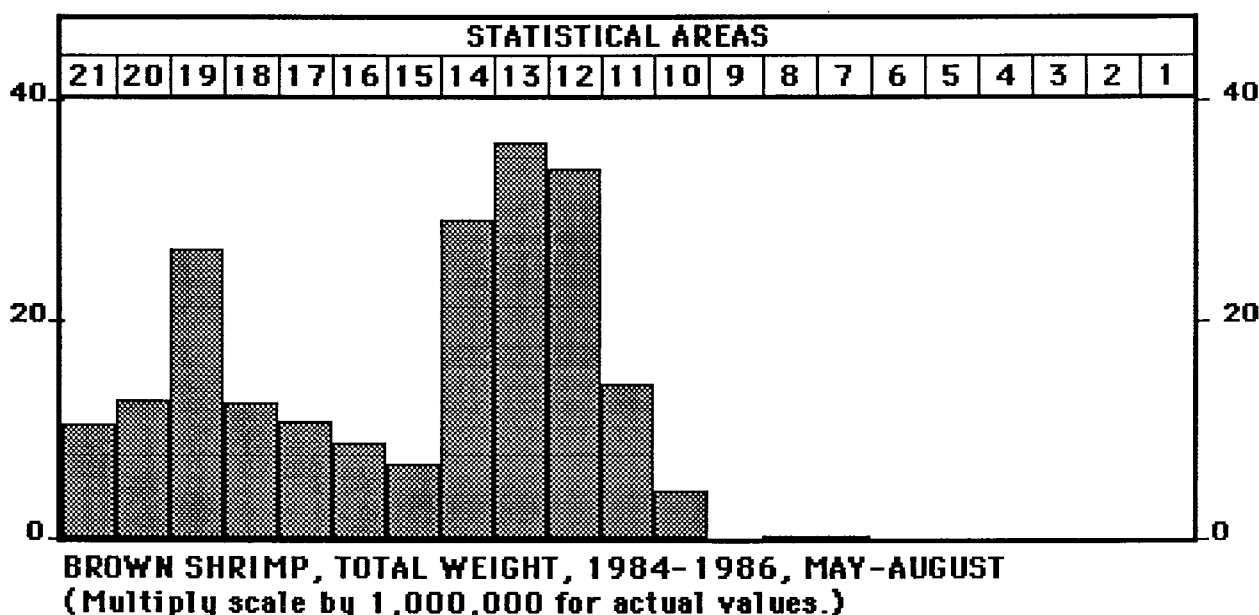
Interval:	Base Area		Analysis Area	
	Cells	Total Value	Cells	Total Value
0.0- 2.0 	114	4.04E7	108	3.69E7
2.0- 4.0 	16	4.92E7	14	4.27E7
4.0- 6.0 	3	1.34E7	2	9.16E6
6.0- 8.0 	1	6.39E6	0	0.00E0
≥ 8.0 	6	9.90E7	2	2.22E7
Totals	140	2.08E8	126	1.11E8

Base Area: Gulf of Mexico, Inshore/Offshore (SA 1-21, DZ 0-10)

Anal. Area: Gulf of Mexico, Offshore (SA 1-21, DZ 1-10)

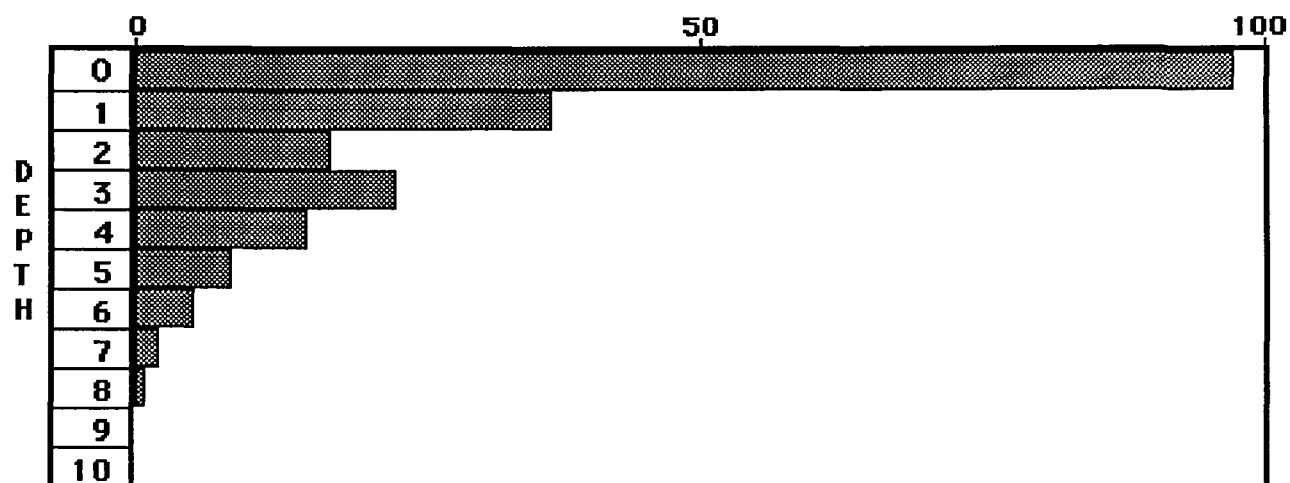
Multiply intervals by 1,000,000 for actual values.

Examine the summary statistics screen carefully. The base area and analysis area are both split into two columns. The first column titled "cells" gives the user information about each statistical subarea-depth zone combination (referred to as a cell) within either the base area or the analysis area. For example, the table indicates that 140 cells are with the base area selected and of those cells, 114 are in the first value interval, 16 are in the second value interval, and so on. The second column titled "total value" gives information about the summed value of all the cells in a given interval range. For example, the 108 cells in the first interval range found in the analysis area have a summed total value of 36,900,000 (3.69E7) pounds. When you have finished studying the table press RETURN to continue. The following appears:



This output is a display of the arithmetic sum across statistical areas. For example, Statistical areas 12, 13, 14 and 19 have total catch greater than 20,000,000 pounds. Enter 'Y' (REMEMBER: CAPS LOCK KEY MUST BE DOWN) for changing the scale and RETURN. Enter '50' for new maximum and RETURN. The histogram will be redrawn on the screen. Enter 'N' for changing the scale and RETURN. Enter RETURN to continue. The next output will be a histogram summary by depth zone.

The following appears:



BROWN SHRIMP, TOTAL WEIGHT, 1984-1986, MAY-AUGUST
(Multiply scale by 1,000,000 for actual values.)

Examine the screen. This is a companion figure to the previous one. In this case the arithmetic sum is taken across Depth Zones. The inshore zone has a catch of about 100,000,000 pounds, while depth zone 1, 0-5 fathoms has a catch of about 40,000,000 pounds. Enter 'N' for changing the scale and RETURN. Enter RETURN to continue. A screen appears informing you that the second series of outputs will follow. These outputs will be for the analysis area selected. The steps are the same as those we just completed for the base area. When you have completed viewing the the second set of outputs the following will appear:

OUTPUT FILE?

**Would you like an ASCII file of the
results placed on the clipboard?**

Enter "Y" or "N"

Enter 'Y' and RETURN. The following appears:

OUTPUT FILE

The output has been stored as an ASCII file on the clipboard for loading into other Macintosh or MSDOS applications.

Refer to the User's Manual for information on the documents which have been created in Microsoft Excel in a format compatible with the data.

This message verifies that your data was saved to the clipboard and is available for other programs outside the Cmas system. The clipboard looks like this (a partial listing only):

0	2648942	11194143	3802092	813716	1730242	471093	
15879117	19593102	30120482	6393439	4288440	154687	82300	
297759	0	0	0	0	0		
70407842	344526	156941	1244799	4147600	3772245		
9712955	12462416	2945274	1963003	45295	17909	138742	
24791451	0	0	0	0			
500129	747882	2606402	1403853	2522931	756047		
1114727	1551741	2998006	687344	2280127	33977	45987	
110941	121643	68800	0	0	0		
2992308	3025686	5010378	3993810	3179744	692257	697552	
1111905	648695	85621	1662974	78013	12886	63931	
12704	0	0	0	0			

Enter RETURN and you will be back at the Main Menu. Lesson 1 is now complete.

Lesson 2. Analysis Areas

An analysis area is an area of specific geographic interest within a larger area of context (the base area). In Lesson 1 we accepted the default areas within the computer. There are many circumstances, however, when a user will wish to select specific areas for analysis. For example, we may wish to focus our analysis on the western Gulf of Mexico, disregarding Florida and Alabama. Within the western Gulf (base area) we may wish to further focus on specific depth zones. Depending upon the problem context, users will wish to define both base and analysis areas. The system provides considerable latitude in designating either.

In this lesson, the "area files" which accompany the data base, and how to enter areas into the system will be examined.

VIEWING AREA FILES

Enter 1, for "Part 1: Defining Analysis Areas", from the Main Menu and RETURN. An explanation screen will appear.

PART 1. ANALYSIS AREAS

The Shrimp Harvest Data Base is organized into 21 statistical subareas; each statistical area is further subdivided into 11 fathom intervals for a total of 231 "grid-cells".

The system is designed to access the data base for any combination of grid-cells. Part 1 allows the user to inventory and prepare "analysis areas". Eight (8) standard areas have been preloaded. Ten (10) "user-defined" areas can be specified.

All parts of the system require a selection of areas from this list.

Read it carefully and RETURN to continue. The "Inventory Selections" screen will appear.

INVENTORY SELECTIONS

1. Simple Listing of Areas
2. Map/Table of Individual Areas
3. Drawing New User-Defined Areas
4. Making Weighted Areas
5. Return to Main Menu

(The default is 5)

Enter Single Number

Enter 1, for "Simple Listings of Areas" and RETURN. The Area Inventory will appear on the screen. DO NOT HIT RETURN.

The inventory is divided into two parts. Part I includes areas 1-18; Part II consists of areas 19-36. Part I is shown on the screen. Note the contents of each area. Area I, for example, includes statistical areas (SA) 1-21 at depth zones (DZ) 0-10 (0 = inshore, 1-10 = offshore areas in 5 fathom increments). Areas 2-7 are combinations of the 11 depth zones, and include all statistical areas. Areas 8-18 include specific statistical areas off the coasts of individual states and include all offshore depth zones. To view Part II, place the pointer over the "MORE" box and CLICK. The remaining eighteen areas will appear on the screen (Areas 19-36). These are the user defined files. Place the pointer over the "STOP" box and CLICK to return to the "Inventory Selections" screen.

Enter 2, for "Map/Table of Individual Areas" and RETURN. The computer will ask for the numbers of areas you wish to view.

Enter '16 1 5', in this order with a space between each number and RETURN. The computer will now ask if you want the first area listed to be a base area, (Texas in this case).

Enter 'N' and RETURN. A table will appear with the first area (Area 16 - Texas SA 18-21, DZ 1-10) selected shown in gray. The cells (subarea-depth zone combinations) that appear in white are cells that are outside of the geographical definition of the selected area. RETURN to continue. The second

area selected (Area 1 - Gulf of Mexico SA 1-21, DZ 0-10), the entire study area, has 10 such cells that are outside the geographical definition. RETURN to continue. The third selection (Area 5 - Gulf of Mexico, Nearshore SA 1-21, DZ 1-3) represents statistical areas 1-21 at depth zones 1-3. Enter RETURN and you will return to the "Inventory Selections" screen.

Repeat the above process (e.g., enter 2, for Map/...), but with one change. This time answer 'Y' to establish the first area (Area 16- Texas) as a Base Area. You will notice a dramatic difference in the tables that you view. This time you will see "grayed" areas only in those cells that are within the base area selected. This is a critical distinction to understand. This is how the software will configure areas that you select. You will always be asked for a "Base Area". Other areas will be configured within the boundary of this area. Enter RETURN until you return to the "Inventory Selections" menu. Remain at this screen.

USER DEFINED AREAS

Enter 3, for "Drawing New User-Defined Areas" and RETURN.

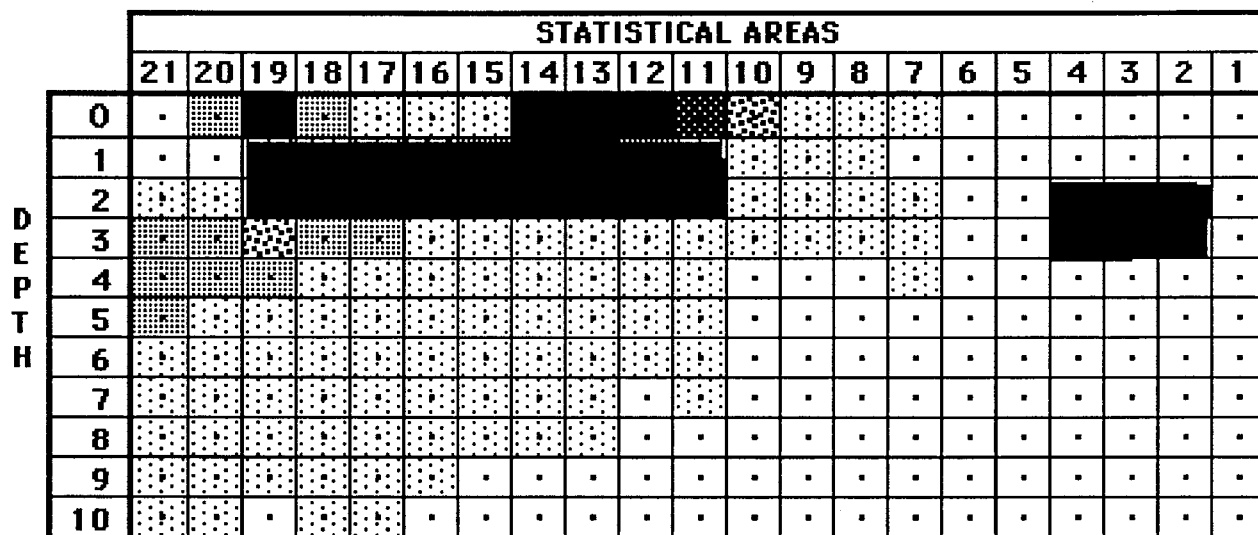
An explanation screen will appear. Read it carefully and RETURN. The "Drawing Template", a blank table will appear on the screen. DO NOT HIT THE RETURN. In the first lesson we stored a map table for drawing. Now we will retrieve it.

With the mouse select "RETRIEVE TABLE FOR DRAWING" from the IN/OUT menu. The table that we stored earlier in Lesson 1 will appear on the drawing template. RETURN to continue. After the return, the instructional message in gray at the top of the screen will indicate that the system is now ready to begin drawing. Before drawing note the "dots" that have appeared in the individual cells of the table. These reference dots are the locations on the screen that the computer will examine to determine whether or not a specific subarea is included. Thus, a user must only make sure that the drawn polygons include the dots for those cells he wants incorporated in his area. We will make a single area which is a combination of two drawn areas: 1) Depth Zones 1 and 2 in Statistical Areas 11-19; and 2) Depth Zones 2-3 in Statistical Areas 2-4. Locate these "target areas" visually on the screen. One last note. There are two ways to draw on the screen. First, you may hold the mouse button down, while at the same time drawing a polygon. Second, you may click the mouse on-and-off at specific locations (e.g., corner points of a rectangle). You may also mix the two together, drawing some continuous lines, followed by points, followed by more lines, etc. Use the one that you feel most comfortable with.

Enclose the first area with the mouse. When finished, release the mouse button and CLICK on the "STOP" box. The area you have drawn will appear in

black on the screen. Don't worry if the area is not perfect. Remember this is a tutorial. Drawing takes a little practice. On the top line the computer will ask if you wish to add another area. Enter 'Y' and RETURN. The gray message will reappear.

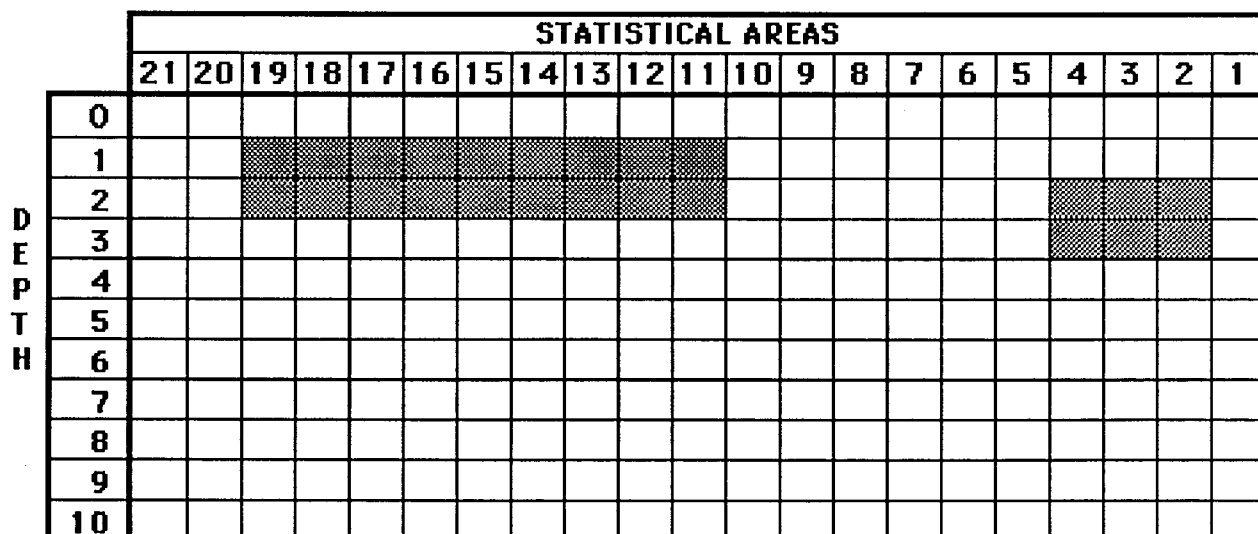
Draw the second area with the mouse. When finished, release the mouse button and CLICK on the "STOP" box. The area you have drawn will appear in black on the screen (shown below).



BROWN SHRIMP. TOTAL WEIGHT. 1984-1986. MAY-AUGUST

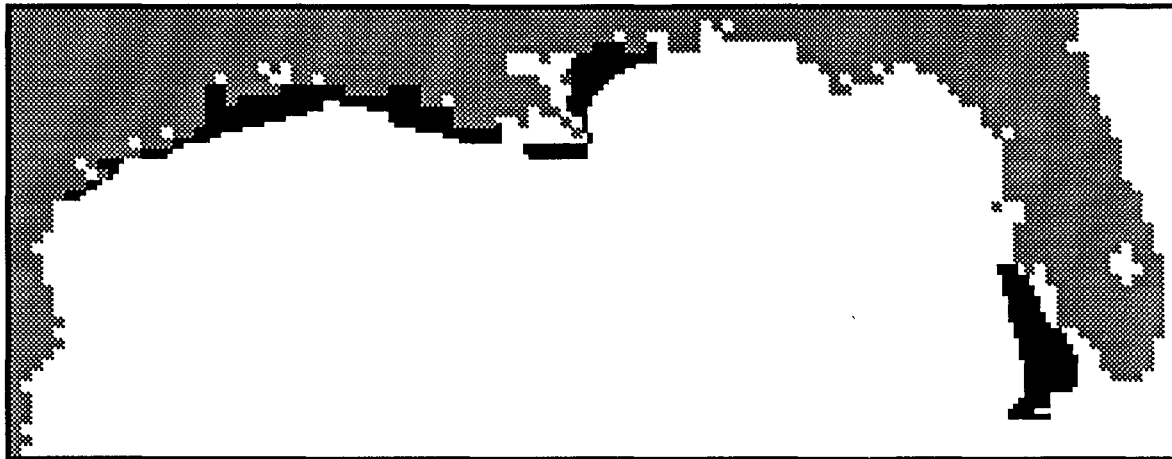
STOP

On the top line the computer will now process your area which will take a few seconds. When completed a tabular schematic with the area in gray will appear.



USER-DEFINED AREA

RETURN to continue. A map of the area will appear.



USER-DEFINED AREA

RETURN to continue. The computer will ask if you want to file this area. Enter 'Y' and RETURN. The "Present Status of User's Area Files" screen will appear. The computer will ask for the number of the area to be replaced. Enter '28' and RETURN. The computer will ask the user to name the area. Enter 'BROWN SHRIMP TUTORIAL AREA' and RETURN. The "Present Status of User's Area Files" screen will reappear, verifying the update. RETURN to continue.

Enter 'N', for starting over and RETURN. You will return to the "Inventory Selections" screen. Enter 5, for "Return to the Main Menu" and RETURN. The Main Menu will appear on the screen.

Lesson 3. Time Series Histograms

In this exercise we will develop graphs and outputs which depict temporal trends within the selected data. We will first look at dollar value of the brown and white shrimp fisheries off the Louisiana and Texas coasts for the 1986 - 1988 period. Next, we will observe trends in size composition of white shrimp off Louisiana.

From the Main Menu enter 3, for "Time Series Histograms" and RETURN. The following explanation screen will appear:

PART 3. TIME SERIES HISTOGRAMS

This part allows you to develop time series histograms for a variety of data types. A limited number of additional data types may also be derived (e.g., total weight/total value). Care should be used in selecting analysis areas, especially the base area for the sequence. The sum of data within this area defines the data for a single bar of the histogram. The number of bars is determined by the number of data types and time periods selected.

Read it carefully. RETURN to continue.

The "Time Series Selection" screen will appear.

TIME SERIES SELECTION

Five options are available:

1. Standard Data Types (by month)
2. Standard Data Types (sum by year, for months selected)
3. Additional Data Types (by month)
4. Size Distribution (lbs., by month)
5. Size Distribution (current \$, by month)

(There is no default value)

Select one

Five options are available. Enter 1, for "Standard Data Types (by month)" and RETURN. (NOTE: standard data types are items like landings, value and effort, while the additional data types under selection 3 are mathematical combinations of the standard set (e.g., catch per unit of effort values).

The following explanation screen appears:

OPTION 1. STANDARD DATA TYPES BY MONTH

This option allows you to develop time series histograms by month for the three basic data type categories (landed weight, ex-vessel value, and days fished) available.

You will be prompted for:

**Data type
Conversion option
Species
Year
Month
Analysis areas**

Read it carefully, and enter RETURN.

DATA TYPE SELECTION

The data base has three categories of data. Landed weight is subdivided into five conversion options. Ex-vessel value is subdivided into three conversion options.

- 1. Landed Weight**
- 2. Ex-Vessel Value**
- 3. Days Fished**

(There is no default)

Select one

The "Data Type Selection" screen is now visible. Enter 2 , for "Ex-Vessel Value" and RETURN.

SIZE CATEGORY SELECT

1. All sizes, including pieces

Excluding Pieces:

- | | |
|-----------------------|-----------------------------------------|
| 2. <15 counts/pound | 9. >67 counts/pound |
| 3. 15-20 counts/pound | <i>For post-1983 data:</i> |
| 4. 21-25 counts/pound | 10. 67-80 counts/pound |
| 5. 26-30 counts/pound | 11. 81-100 counts/pound |
| 6. 31-40 counts/pound | 12. 101-116 counts/pound |
| 7. 41-50 counts/pound | 13. >116 counts/pound |
| 8. 51-67 counts/pound | (Note: 10-13 CANNOT BE CHOSEN WITH "9") |

(The default is 1)

Select 1 or any combination of 2 through 13

The "Shrimp Size Selection" screen should now be visible. Enter 9, for ">67 counts / pound" and RETURN. This will choose the smaller sized shrimp for the analysis. The following screen should appear:

VALUE CONVERSION SELECTION

Ex-Vessel Value:

1. Current dollars
2. October 1982 dollars
3. User-defined dollars

(The default is 1)

Select one

Enter 2, for "October 1982 dollars" and RETURN. This will inflate or deflate the current dollar value for a chosen month by a standard index value. This index value is obtained through comparison of current dollars and the standard dollar value set by the Department of Commerce (October 1982). The "Species Selection" screen will now appear (see Lesson 1 for graphic image if needed).

Enter '1 3', for "Brown and White Shrimp" and RETURN. The "Year Selection" screen should now be visible (see Lesson 1 for graphic image if needed).

Enter '26 27 28', for "(1986-1988)" and RETURN. The "Month Selection" screen should now appear (see Lesson 1 for graphic image if needed).

Enter 13, the default for all months and RETURN. The "Selecting Two Areas" screen should now be visible. It will appear as follows:

SELECTING TWO AREAS

**Do you want to select your areas for the run?
If you answer "N", the computer will select:**

AREA 1. Gulf of Mexico Study Area (SA 1-21, DZ 0-10)

AREA 2. Gulf of Mexico, Offshore (SA 1-21, DZ 1-10)

Enter "Y" or "N"

Enter 'Y' and RETURN. With the mouse CLICK on the "STOP" box. Enter 15 (Louisiana and Texas, offshore) and 16 (Texas, offshore) and RETURN. The base area selection screen should now be visible:

BASE AREA SELECTION

The base area defines the overall mapping area. Portions of analysis areas outside of the base area are not included in the processing operations. The areas you selected have been renumbered sequentially as follows:

AREA 1: Louisiana and Texas (SA 13-21, DZ 1-10)
AREA 2: Texas (SA 18-21, DZ 1-10)

(The default is 1)

Enter Number of Base Area

Make certain that AREA 1 is both Louisiana and Texas (the base area) and that AREA 2 is Texas only (the analysis area). If this is correct just enter RETURN. If this is not the case, then select Louisiana and Texas as the base area by entering 2 and RETURN. The next screen will give you a last opportunity to select or change the base area. Enter RETURN. The "Labeling Outputs" screen will now appear.

Enter the following label for the analysis: 'BROWN AND WHITE SHRIMP, > 67 COUNT, 1986-1988' and RETURN.

When the data processing is complete, the program will prompt you as to whether or not you would like an explanation of the histogram outputs. Enter 'Y' and RETURN.

An explanation screen (shown below) will appear. Read it carefully. Enter RETURN to continue.

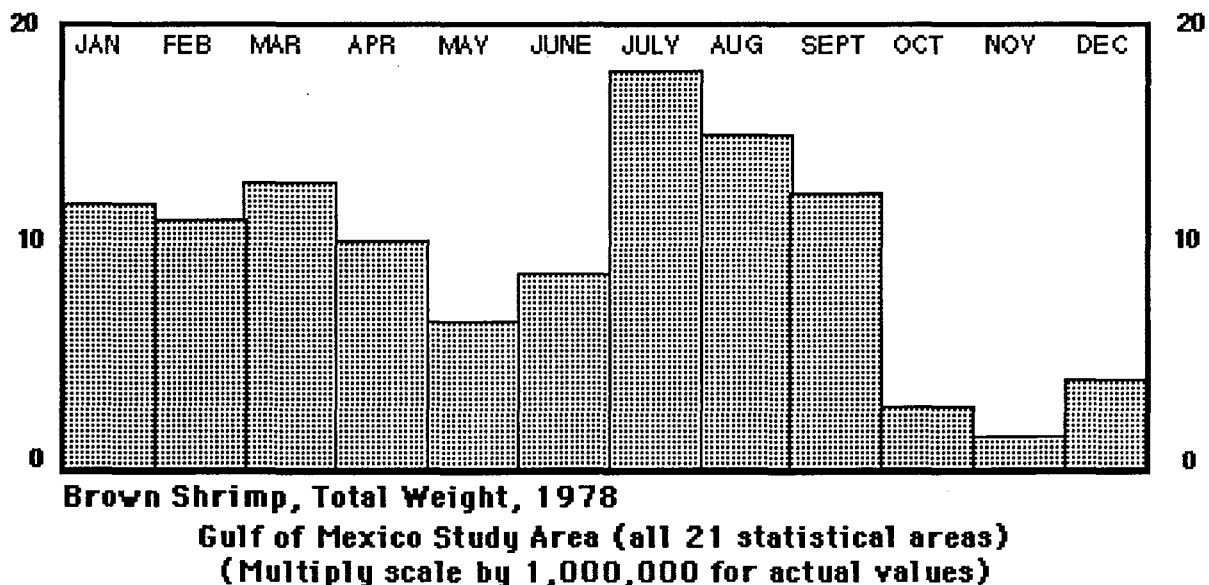
TIME SERIES HISTOGRAMS

The histograms are designed to display a wide variety of information and provide considerable flexibility in selecting species, years, and months. Up to 200 bars can be shown, which makes full labeling of the histogram next to impossible. The user is advised to enter sufficient information in the "output label" in order to appropriately label the histogram when copying the screen into another application.

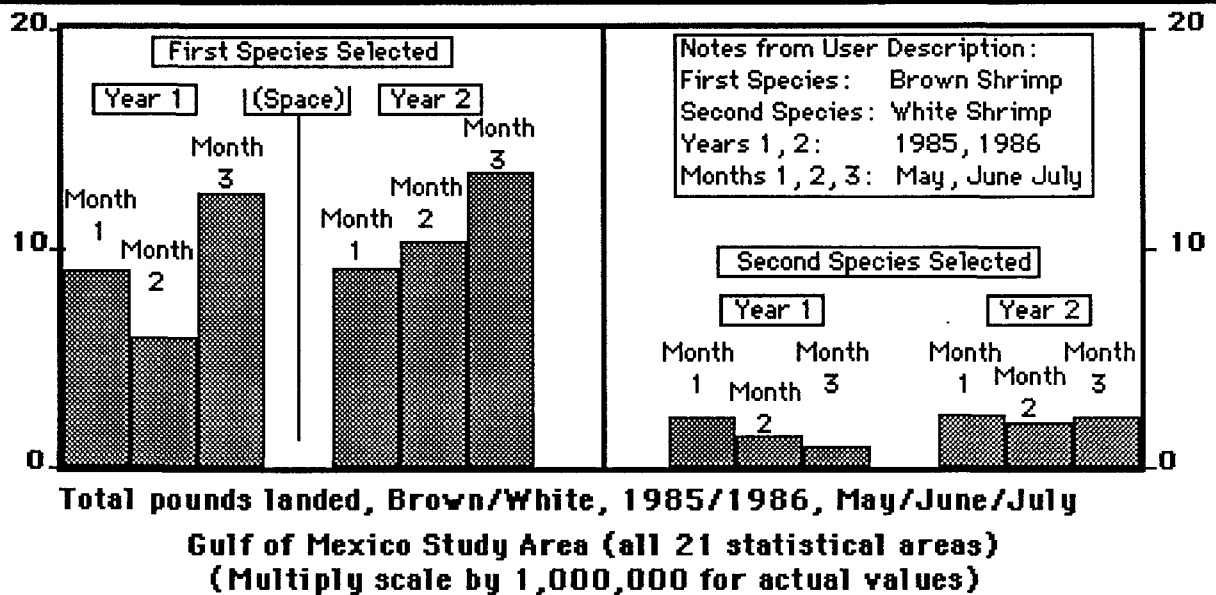
The next two screens will provide a "roadmap" for the layout and labeling of the histograms. They should serve as a guide to interpreting the screen image.

Carefully examine the next two "example" screens (shown below). Entering RETURN will allow you to pass from screen 1 to screen 2 and then to the data screens.

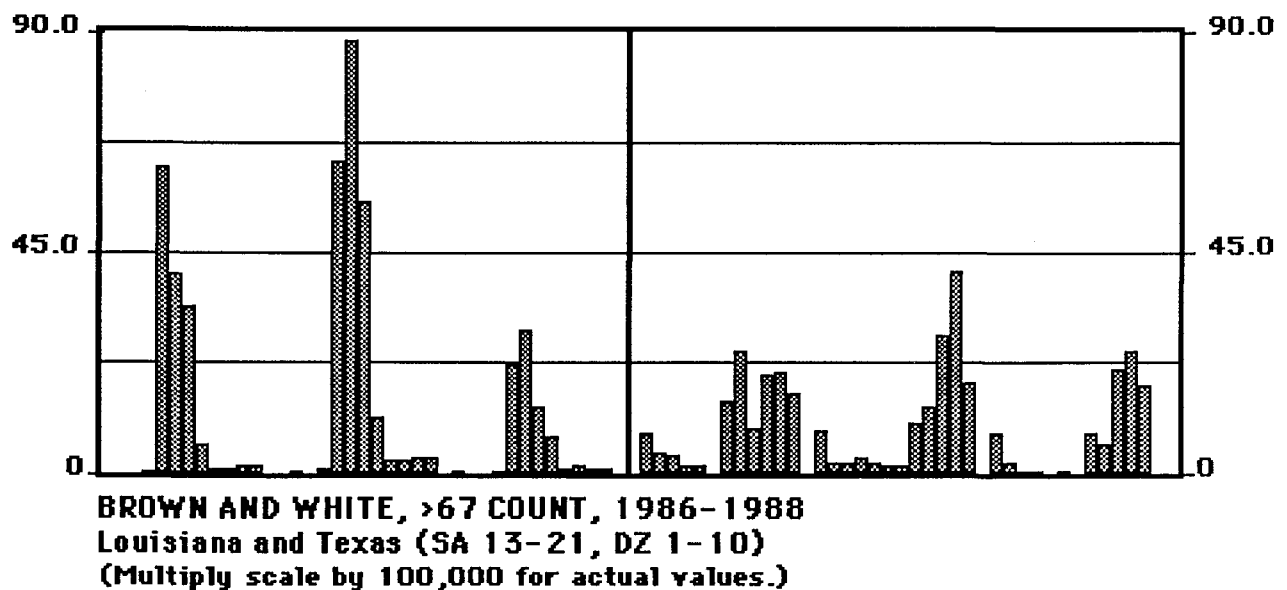
EXAMPLE OF SIMPLE CASE, 1 SPECIES, 1 YEAR, 12 MONTHS



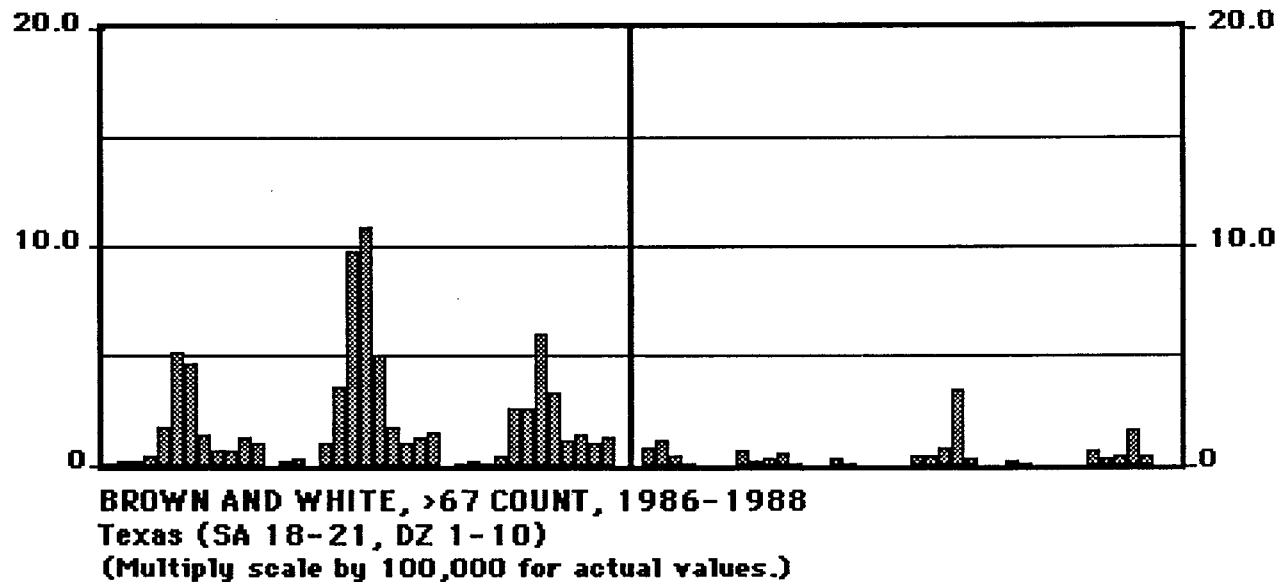
EXAMPLE OF 2 SPECIES, 2 YEARS, 3 MONTHS



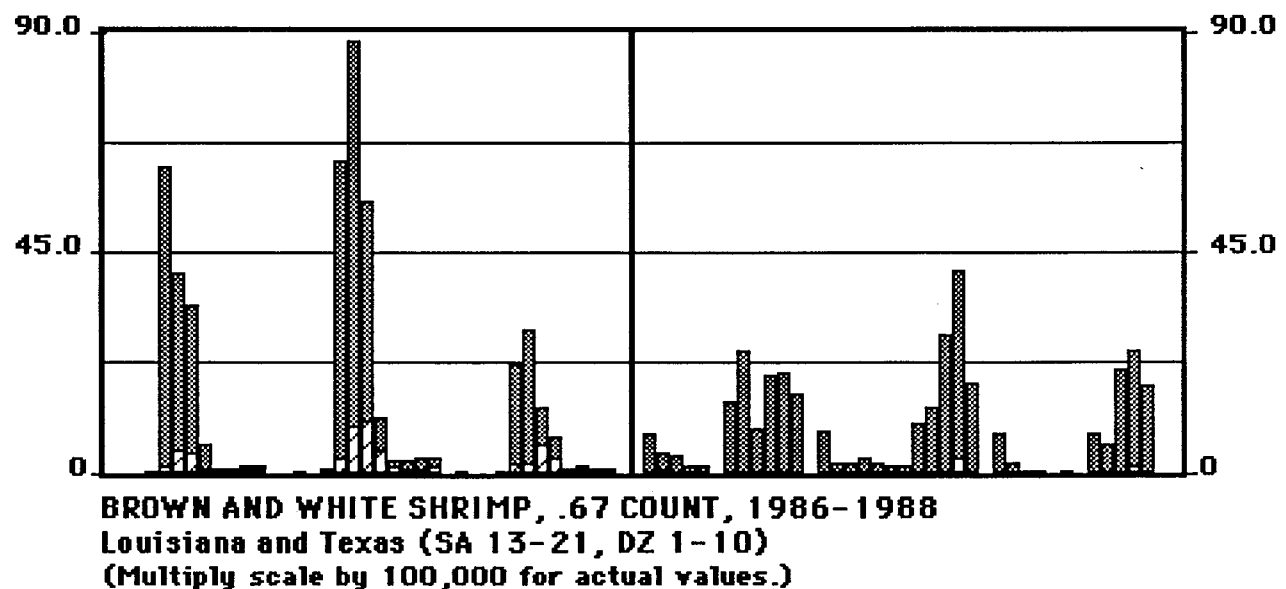
Your data should now be displayed in histogram form. It should appear as follows:



This screen represents the combined Louisiana and Texas dollar values for brown (left side of the graph) and white (right side of the graph) shrimp by month during the 1986 - 1988 period. Enter RETURN.



This screen represents the Texas area only. When you have finished viewing the screen enter RETURN. The following screen will appear:



The third histogram screen shows the base area values (Louisiana and Texas) as dark portions of the bars and the analysis area values (Texas only) as light portions of the bars. See if you can change the scale to a value that will allow the analysis area data to become more visible (select 45 or less). Lesson 1 will help you with this exercise if you have forgotten how. (NOTE: at this new scale some of the bars will be off the graph). Enter RETURN. The ASCII screen prompt should appear. You could place the data into an ASCII file like we did in lesson 1, but for this lesson just enter RETURN.

You should now be back at the Main Menu screen and ready to undertake the second part of this lesson.

Enter 3, from the Main Menu and RETURN. (NOTE: most of the basic screens should be familiar to you by this time and will not be graphically displayed; only unique or important screens will be reproduced in this tutorial).

Once this informational screen is viewed enter RETURN. The following screen should now appear:

TIME SERIES SELECTION

Five options are available:

- 1. Standard Data Types (by month)**
- 2. Standard Data Types (sum by year, for months selected)**
- 3. Additional Data Types (by month)**
- 4. Size Distribution (lbs., by month)**
- 5. Size Distribution (current \$, by month)**

(There is no default value)

Select one

Enter 4, for "Size Distribution (lbs by month)" and RETURN.

An "Informational" screen should appear. It will display the information that you will be prompted for during this analysis. Enter RETURN.

When the "Species Selection" screen is displayed, enter 3 for "White Shrimp" and RETURN.

When the "Year Selection" screen is displayed, enter '27', for "1987" and RETURN.

From the "Month Selection" screen enter '6 7', for "June and July" and RETURN.

When the "Area Selection" screen appears enter 'Y' and RETURN.

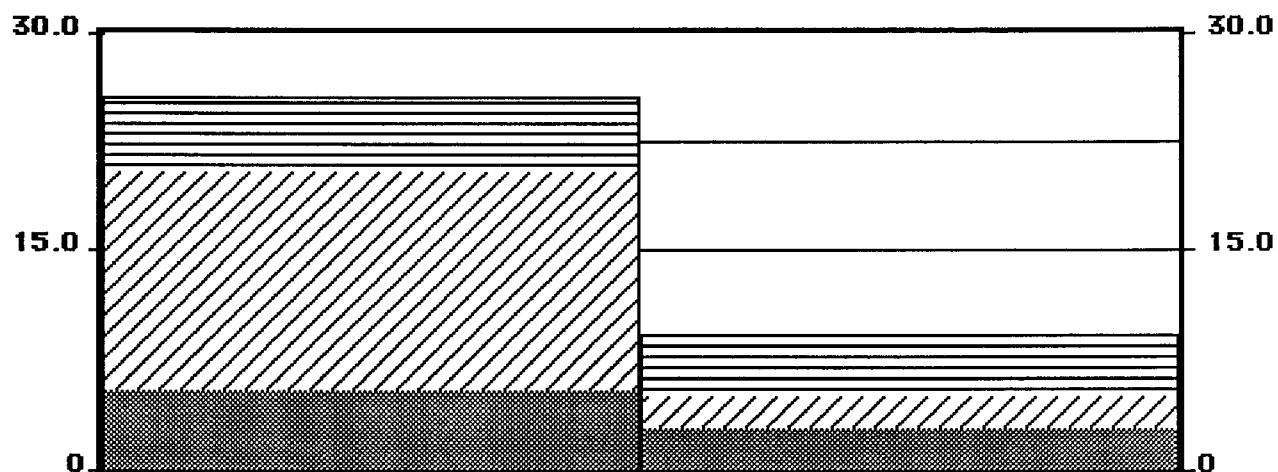
Use the mouse and CLICK on the "STOP" box. Enter '14 5' (Louisiana) and (Gulf of Mexico, nearshore) and RETURN. (NOTE: 14 should be entered first as that it will be the base area and 5 will be the analysis area). This will allow us to view all the offshore data from Louisiana and then to look at only the first three depth zones from this state.

Utilize the two "Base Area Selection" screens to make certain that Louisiana (SA 13-17, DZ 1-10) is the base area. Enter RETURN twice.

When the "Labeling Outputs" screen is visible enter a label for this analysis and RETURN. We entered "WHITE SHRIMP, 1987, JUNE AND JULY, LOUISIANA".

When the computer prompts you if you want an explanation of the histogram outputs, enter N and RETURN (NOTE: you have already viewed these screens earlier in this lesson).

A pattern selection screen will appear. Use this screen to customize the stacked bar output which will be displayed next. To change a particular pattern, use the mouse to CLICK on the pattern you want a certain size category to be displayed with. There are four possible pattern choices for each size category. The selected patterns will appear in the far right-hand column. CLICK on the "OK" box when you have finished. The following should appear:



WHITE SHRIMP, 1987, JUNE AND JULY, LOUISIANA
Louisiana (SA 13-17, DZ 1-10)
(Multiply scale by 100,000 for actual values.)

Your patterns may appear different depending on the pattern combinations you selected. The first bar represents June data and the second bar represents July data for the base area. Enter RETURN. When the new prompt appears "Do you want individual size frequency histograms", enter 'Y' and RETURN. The following screen will be visible:

SIMPLE HISTOGRAM SELECTION

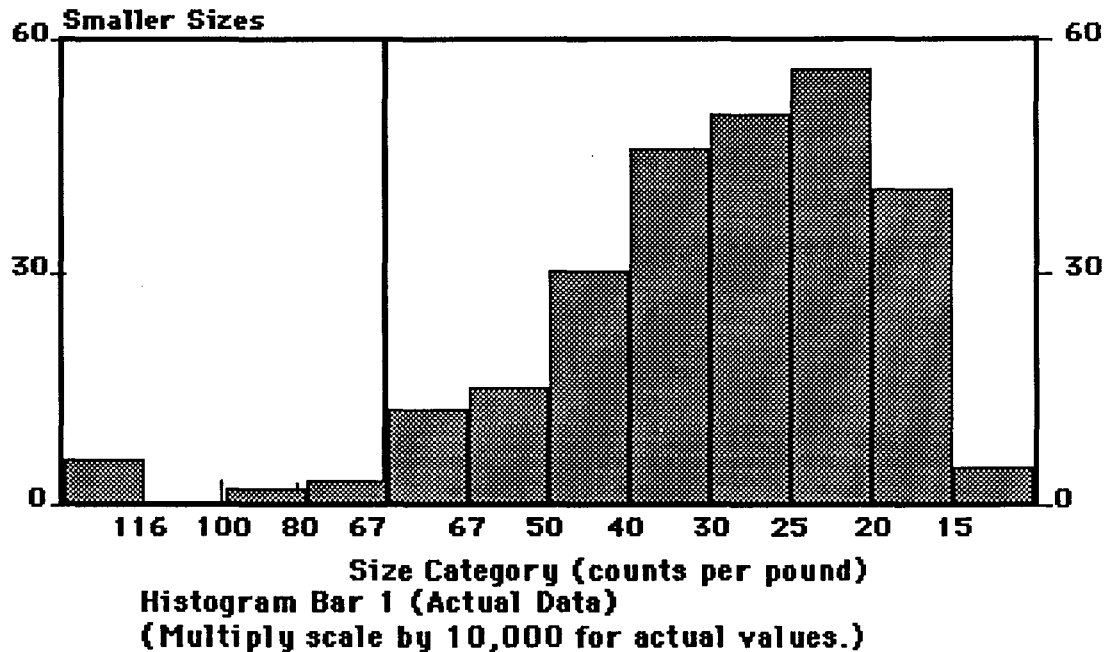
- 1. Actual Data***
- 2. Actual Data, Cumulative***
- 3. Per Cent of Total***
- 4. Per Cent of Total Cumulative***

(The default is 1)

Select any combination

Enter 1 and RETURN.

You will now be prompted to enter the bar numbers you want to observe in detail. In this data set you only have two bars and since we want to look at both of them, enter '1 2' and RETURN. The following should appear:



This graph gives you a display of the catch of white shrimp off the coast of Louisiana during the month of June, by size categories. The right side of the graph gives the values for the eight major size categories, while the left side of the display shows the >67 count category broken down into 4 count groups. Enter RETURN to display the July 1987 data.

Enter RETURN and the bars for the analysis area (depth zones 1-3 off Louisiana) will appear. Try different functions as you look through the data set.

When you are complete with this data set you should be back at the Main Menu and Lesson 3 will be complete.

Lesson 4. Tabular Summaries

In this lesson you will learn about the programs ability to summarize important information and present it in tabular form.

From the Main Menu enter 4, for "Tabular Summaries" and RETURN. (NOTE: only unique or important screens will be displayed for your information in this tutorial for lesson 4). The following screen will appear:

TABULAR SUMMARY SELECTION

This part provides tables of values for each data category (e.g., landed weight by size category, days fished, total ex-vessel value, and fishing effort).

Two options are available:

- 1. Values by year (for months selected) for four (4) analysis areas; and**
- 2. Values by month for a single area.**

(There is no default)

Select one

From the "Tabular Summary Selection" screen we will select "Values by Month for a Single Area". Enter 2 and RETURN.

From the "Species Selection" screen enter 2, for "Pink Shrimp" and RETURN.

From the "Selecting One Area" screen enter 'Y' and RETURN. The "Area Inventory" screen should now be displayed.

Use the mouse to CLICK on the "STOP" box and enter '8' (Tortugas Area, SA 1-3, DZ 1-10) and RETURN.

When the "Year Selection" screen appears enter '25' for "1985" and RETURN.

From the "Month Selection" screen, enter 13 (default, all months selected) and RETURN.

When the "Labeling Output" screen appears, enter a label. We entered "PINK SHRIMP, 1985, TORTUGAS AREA".

Once the program is done with processing the data, the following screen will appear:

SELECT SIZE CATEGORIES FOR OUTPUT TABLE

The output table can display up to eight individual sizes. Please select the categories to appear.

- | Standard size categories: | Small size categories (post 1983): |
|---------------------------|------------------------------------|
| 2. <15 counts/pound | 10. 68-80 counts/pound |
| 3. 15-20 counts/pound | 11. 81-100 counts/pound |
| 4. 21-25 counts/pound | 12. 101-115 counts/pound |
| 5. 26-30 counts/pound | 13. >115 counts/pound |
| 6. 31-40 counts/pound | |
| 7. 41-50 counts/pound | |
| 8. 51-67 counts/pound | |
| 9. >67 counts/pound | (The default is 2 3 4 5 6 7 8 9) |

Select any combination of 2 through 13

From the "Select Size Categories for Output Table" screen, select the default (2-9) by entering RETURN. (NOTE: The smaller size categories will still be available from the ASCII file at the end, they will simply not be shown in the tables displayed on the screen).

The following screen (Table) should now be displayed on the screen.

PINK SHRIMP, 1985, TORTUGAS AREA**Species: 2; Area: 8; Cols: 1.(1 1985) 2.(2 1985) 3.(3 1985) 4.(4 1985)**

Data Type	x (000)	Month 1	Month 2	Month 3	Month 4
<15 count	0	12,242	32,948	19,886	21,016
15-20 count	0	206,675	274,509	169,052	195,104
21-25 count	0	200,291	147,729	114,608	132,907
26-30 count	0	571,734	212,307	122,553	125,570
31-40 count	0	161,623	147,029	69,546	91,944
41-50 count	0	254,837	123,009	98,311	100,479
51-67 count	0	359,424	264,791	134,330	177,053
>67 count	0	123,057	211,335	169,820	312,984
Total Weight	0	1,889,883	1,413,657	898,106	1,157,057
Total Value	0	5,488,071	4,239,642	2,575,384	3,114,327
Days Fished	0	2,640	2,412	2,061	2,264
Weight/Day	0	716	586	436	511
Value/Day	0	2,079	1,758	1,250	1,376

Notice the format of the Table. The months (January - April) are displayed across the top (columns), while the data types are shown along the sides (rows). Enter RETURN. The next four month table screen (May - August) should appear. As with the first table screen, the months and year are given on the second line of the title - Cols: 1. (5 1985), 2. (6 1985), and so on. Enter RETURN, for a display of the final four month table (September - December).

Enter RETURN when you are done with the last table. The ASCII file savings screen should appear. Enter 'N' and RETURN.

You should now be back at the Main Menu screen and lesson 4 is complete.

Lesson 5. Working with Stored Maps

Before we begin this lesson, we will need to create and store two maps. The first map will be entitled "Gulf of Mexico, Brown Shrimp Catch (lbs), 1981". The second map will be entitled "Gulf of Mexico, Brown Shrimp Effort (days), 1981".

Do you recall which part (lesson) we will select from the Main Menu to make our maps? Correct, "Part 2: Making Maps and Simple Summations". Therefore, enter 2 and RETURN.

An explanation screen will appear for your review. Enter RETURN.

Enter 1, for "Brown Shrimp", from the "Species Selection" screen and RETURN.

From the "Data Type Selection" screen, enter 1 for "Landed-Weight" (catch) and RETURN.

Enter 1, for "All Sizes", from the "Size Category Select" screen and RETURN.

From the "Weight Conversion Selection" screen, enter 1 for "Heads Off - pounds" and RETURN.

Enter '21', for "1981", from the "Year Selection" screen and RETURN.

Enter 13, the default for all months, from the "Month Selection" screen and RETURN.

An "Output Selection" screen will appear.

OUTPUT SELECTION

- 1. Map Table (Depth zones by subareas)**
- 2. Schematic Map of Region**
- 3. Summary Statistics**
- 4. Histogram Summary by Statistical Subareas**
- 5. Histogram Summary by Depth Zone**

- 6. Save Map in User's Files**

(The default is 1, 2, 3, 4, and 5)

Select any combination

Enter 6, for "Save Map in User's File" and RETURN.

From the "Selecting Two Areas" screen, enter 'N' and RETURN.

The "Labeling Outputs" screen will now appear. Enter label.

After the computer processes your request, an "Output Set 1" screen will appear. Enter RETURN.

The following explanation screen, "Storing a Map", will appear. Read it carefully and RETURN.

STORING A MAP

*You have requested that a map be stored in your working file.
The next screen will ask you the following:*

- 1. To identify which component of your present file you wish to replace.*
- 2. To provide a formal name for the new component.*

Your response is limited to 70 characters. Capture as much information as possible in this space to avoid confusion.

Following these questions you will be shown the new structure of your files prior to storing the map. You may change your decision at this point.

A "Stored Map Inventory" screen will appear, and the computer will ask for a map number to be replaced. These are "our" active map files, so we could select any number between 1 and 10. For this lesson, we will replace Map 1. Therefore, enter '1' and RETURN.

The computer will ask for the name of the new component. We will enter an abbreviated name for the map we just created. Enter 'GOM, Brown Shrimp Catch, 1981' and RETURN.

The next screen, "Revised Stored Map Inventory", should include our new map. If so, enter 'Y' and RETURN. The computer will tell you that your "MAP HAS BEEN SAVED". Enter RETURN.

Enter RETURN for the "Output Set 2" screen.

Enter 'N' for the ASCII savings file and RETURN.

The Main Menu should now be on the screen.

We will now make our second map, following the same steps as above, but with the following changes:

Enter 3, for "Days Fished" (effort), from the "Data Type Selection" screen.

We will label our second map "Gulf of Mexico, Brown Shrimp Effort (days), 1981".

After you have stored map 2 and it appears as "Map 2. GOM, Brown Shrimp Effort, 1981" on the "Stored Map Inventory" screen, RETURN to the Main Menu.

We will now begin Lesson (Part) 5. From the Main Menu, enter 5 for "Working with Stored Maps" and RETURN.

The following explanation screen will appear:

PART 5. WORKING WITH STORED MAPS

In Part 2 a map can be stored in a small, 10-record user file. This part allows:

- 1. Simple Outputs*
- 2. Areal Analysis. Examining a map or maps within the context of specific areas or taking an areal average.*
- 3. Linear Combinations. Simple arithmetic combinations of two maps (i.e., subtraction, division, etc.).*
- 4. Send a Map to the Clipboard*
- 5. Return to Main Menu*

(The default is 5)

Enter single number

Read it carefully. There are many mathematical combinations possible. For this lesson, we will examine "Linear Combinations", so enter 3 and RETURN.

The "Linear Combinations" screen (shown below) should now be visible.

LINEAR COMBINATIONS

1. Multiply a Map by a Constant
2. Simple Sum of Any Two Maps
3. Simple Difference of Any Two Maps
4. Simple Product of Any Two Maps
5. Simple Ratio of Any Two maps
6. Relative Difference of Any Two Maps
7. Return to Previous Screen for Exit

(The default is 7)

Enter single number of operation desired

In this lesson, we will examine 1981 brown shrimp "catch per unit effort" (CPUE) for the Gulf of Mexico using the two maps we just finished making and storing in Part 2. (NOTE: CPUE = catch/effort). Therefore, enter 5 for "Simple Ratio of Any Two Maps" and RETURN.

The following explanation screen will appear:

SIMPLE RATIO

This calculates ratio of two maps, dividing values in individual subareas.

$$CN(i,j) = C1(i,j) \div C0(i,j) \quad i = 1, \dots, 21 \quad j = 1, \dots, 11$$

CN = New map

C1 = First map selected

C0 = Second map selected

The user will be prompted for:

1. Stored maps
2. User description
3. Analysis areas
4. Outputs

Read it carefully. Notice that C1 will be catch (Map 1) and CO will be effort (Map 2). Enter RETURN.

The next screen, "Selecting Two Maps", will ask for two map numbers. Enter '1 2' and RETURN.

Next, the computer will ask for the number of "C1". In this case we want catch/effort, so Map 1 is our selection. Enter '1' and RETURN.

The computer will ask if this is correct. Enter 'Y' and RETURN.

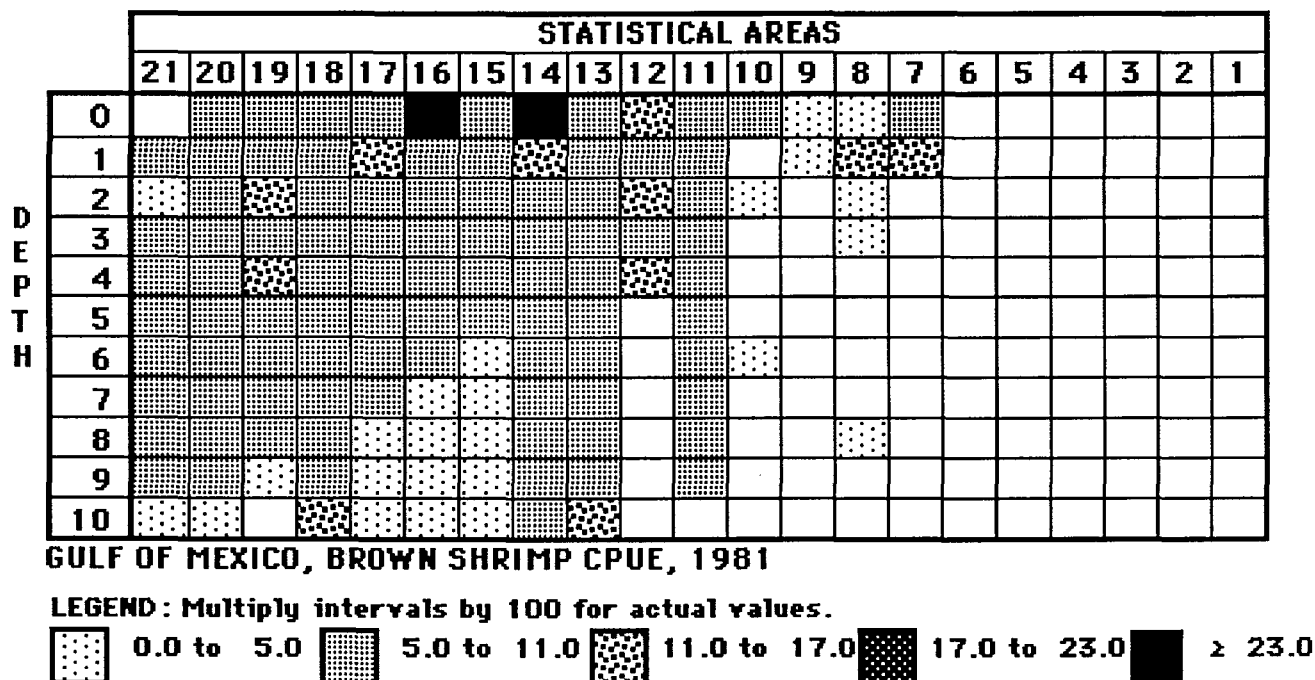
Enter the name of the run. We entered "Gulf of Mexico, Brown Shrimp CPUE, 1981".

Enter 'N' and RETURN for "Selecting Two Areas".

The "Output Selection" screen will now appear. Enter 1, for "Map Table (Depth zones by subareas)" and RETURN.

The computer will prompt you "Do you want to proceed?", enter 'Y' and RETURN.

The next screen (shown below) will display: "Gulf of Mexico, Brown Shrimp CPUE for 1981".



ter RETURN to continue.

Enter 'N' and RETURN for changing intervals.

To exit, enter 7, from the "Linear Combinations" screen and RETURN.

From the next screen, "Working with Stored Maps", enter 5 to return to the Main Menu.

This completes Lesson 5.

Appendix 1. Initial Startup Selection Screen

When you begin the Cmas-Shrimp Harvest program, the first screen that you are confronted with gives you a choice of six options. Each of these are explained below:

Brown, White and Pink: This selection allows you to access the general commercial data base for brown, white and pink shrimp. All data types can be accessed by month, statistical subarea, and depth zones (inshore and 5 fm increments of depth offshore). The data types include catch (where the shrimp were caught, not where the shrimp were landed), directed effort (units are in days fished; e.g., 24 hours of trawling) and size (shrimp measured in number of tails per pound, termed count; pre-1984 shrimp were lumped into only eight count groups, but post-1984 all the shrimp sizes were recorded and eleven count groups can be accessed in the program). Mathematical combinations of the data types are possible within the program.

Other Species: This selection allows you to access the general commercial data base for the other shrimp species caught in the Gulf of Mexico. These species include seabobs, rock shrimp, roughneck shrimp, and royal reds. The data types can be accessed by month, statistical area and depth zone. The data types include both catch and effort, but only catch gives accurate results.

Texas Closure (Brown, White and Pink): This selection accesses the brown, white and pink data base, but the data is grouped into time periods related to the closure to shrimping off Texas, instead to months. Period 1 is from January 1 - April 30, period 2 is from May 1 - closure start, period 3 is the closure period, period 4 is from the closure end - July 31 and period 5 is from August 1 - December 31.

Texas Closure (Other Species): This selection allows access to the other species data base, but the data types are grouped into periods related to the closure off Texas, instead of months.

Utility: This selection allows you to manage the stored maps and analysis areas in the program. From the utility area you can archive current maps and areas, or bring maps and areas from the archive area to the active list. You can also display colored views of maps currently in the active list.

Quit: This selection allows you to exit the program.

APPENDIX 2: FUNCTION OF ITEMS FROM THE PULL DOWN MENU AREAS AT THE TOP OF THE SCREEN.

IN/OUT MENU:

STORE TABLE FOR DRAWING: This item stores a copy of a screen map table image in RAM memory outside of the clipboard area. Only one item at a time can be stored in this area.

RETRIEVE TABLE FOR DRAWING: This selection causes an image to be brought out of the RAM storage area and displayed on the screen.

SCREEN TO CLIPBOARD: This item stores a screen image into the clipboard area. From the clipboard this picture item can be pasted into another application.

CLIPBOARD TO SCREEN: This selection takes an image from the clipboard area and pastes it on the screen.

MAKE POINTER: This item causes the mouse pointer icon on the screen to be displayed as an arrow pointer and not the 'I' shaped image that it normally appears as in the program.

CORRECT FOR DAYS FISHED: This selection causes effort values within a location cell to be "over-looked" if they are less than the chosen minimum value.

RESTART: This item causes the CMAS program to stop what it is doing and "re-boot" back to the beginning of the program.

MAP REFS MENU:

STATISTICAL AREAS: This selection causes the 21 statistical areas to be drawn (overlayed) onto the current displayed map.

FATHOM LINES: This item causes fathom lines (10, 20, 30, 40 and 50) to be displayed over the current map image on the screen.

LATS. AND LONGS.: This selection causes the latitudes and longitudes for the Gulf of Mexico to be superimposed over the current map image.

STATE BOUNDARIES: This item causes the boundaries between the states along the Gulf of Mexico to be drawn on the current map.

LISTS MENU:

ANALYSIS AREA: This selection lists the current assortment of user areas available in the program.

STORED MAPS: This selection causes a list of the stored maps to be displayed on the screen. These maps are the ones available to be used in the program.

ANALYSIS AREA ARCHIVE: This item causes a list of the analysis area archive files to be displayed on the screen.

STORED MAP ARCHIVE: This selection causes a list of the map archive files to be displayed on the screen.